

REMARKS

In paragraph 2 of the final Action of March 4, 2009, claims 5, 11, 15 and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hrivnak et al. in view of Myers et al.

In paragraph 3 of the final Action, it was held that the invention does not claim drawing a clamped sheet. However, the Examiner's opinion is in correct, because in the step 3), the portion of thermoplastic resin is clamped at a clamping position and then, in the step 4), the inner portion is drawn relative to the clamping position. In the steps 3) and 4), it is clear that the sheet clamped at the clamping position is drawn.

In view of the Examiner's opinion in paragraph 3 of the Action, however, claim 15 has been amended to clarify the feature of the invention.

Namely, the method of claim 15 generally comprises the steps of:

- 1) fixing an outer periphery of a portion to be formed to a cup-shaped vessel of a thermoplastic resin sheet by pre-clamped molds;

- 2) pre-forming an inner portion of the fixed portion of the thermoplastic resin sheet by a plug, wherein a portion corresponding to an orifice portion or a flange portion of the cup-shaped vessel is drawn;

- 3) clamping the portion corresponding to the orifice portion or the flange portion of the cup-shaped vessel further by an upper mold and a lower mold; and

- 4) drawing an inner portion of the clamped portion further by the plug.

Thereafter, the drawn portion is pneumatically formed into a shape of a lower mold, and the inside of the formed article is decompressed to form the final product.

On the other hand, Hrivnak discloses a method comprising:

- 1) drawing an unclamped resin sheet by a plug;
- 2) clamping the drawn resin sheet; and
- 3) pneumatically forming the resin sheet into a shape of a heated lower mold.

Thereafter, the inside of the formed article is decompressed to form the formed article.

In comparing the present invention, therefore, Hrivnak does not have the pre-forming step of the invention.

Since the pre-forming step is not included in Hrivnak, the unclamped sheet can not be sufficiently pushed by the plug. A formed article cannot be entirely drawn. Accordingly, by the subsequent thermal fixing by means of a heated lower mold, the lateral portion can obtain the oriented crystallization as well as heat resistance and mechanical strength while a transparency is maintained. However, the bottom portion cannot be sufficiently drawn thereby causing embrittlement and whitening as well as spherocrystallization.

Therefore, the process disclosed in Hrivnak provides the heat resistance, but not the transparency or mechanical strength. Hence, the present invention is significantly different from Hrivnak, and accordingly, the final product is also significantly different in terms of the mechanical characteristics.

In Myers, the method for thermoforming plastic foam articles comprises:

- 1) fixing a thermoplastic resin sheet outside a forming portion of a cut-shaped vessel for forming a fixed portion of the thermoplastic resin sheet;
- 2) pre-forming an inner portion of the fixed portion by a plug, wherein a portion corresponding to an orifice portion or a flange portion of the cup-shaped vessel is drawn;
- 3) drawing an unclamped portion further by the plug; and

4) pneumatically forming a drawn thermoplastic resin sheet into a shape of a female mold.

Then, the pneumatically formed resin sheet is clamped, and the article is cooled.

In Myers et al., when the lateral portion and the bottom portion of the article are formed, the plug is pushed into the unclamped sheet. Therefore, Myers et al. does not have the pre-clamped step of the invention.

The Examiner held that Hrivnak discloses the process disclosed in the present invention except for the step of fixing a thermoplastic resin sheet outside a forming portion of a cut-shaped vessel, and that Myers et al. discloses the step of fixing a thermoplastic resin sheet outside a forming portion of a cut-shaped vessel and the step of thermal-forming the fixed thermoplastic sheet.

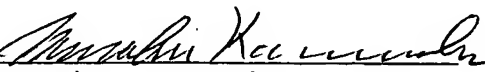
However, both of the cited references do not disclose the pre-forming step of the invention. As explained above, the pre-forming step is very important, but the cited references do not disclose or suggest the pre-forming step of the invention.

Therefore, even if the cited references are combined, claim 15 is not obvious from the cited references. Claim 15 and the depending claims should be patentable over the cited references.

Reconsideration and allowance are earnestly solicited.

Respectfully Submitted,

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